HOMESTAKE MINING COMPANY NPL SITE

SAI S. APPAJI

U.S. EPA Region 6

Dallas, Texas

9787542

Community Upset with Groundwater Cleanup

- BVDA Wants EPA to Change Cleanup Levels
  - Met with EPA and State in August 2014
  - Presented historic data (1960s)
  - Wants EPA to reassess
- Requests Follow-up Meeting with EPA
  - March 5, 2015
- Hired Technical Consultant
  - Preparing report to support position at upcoming meeting

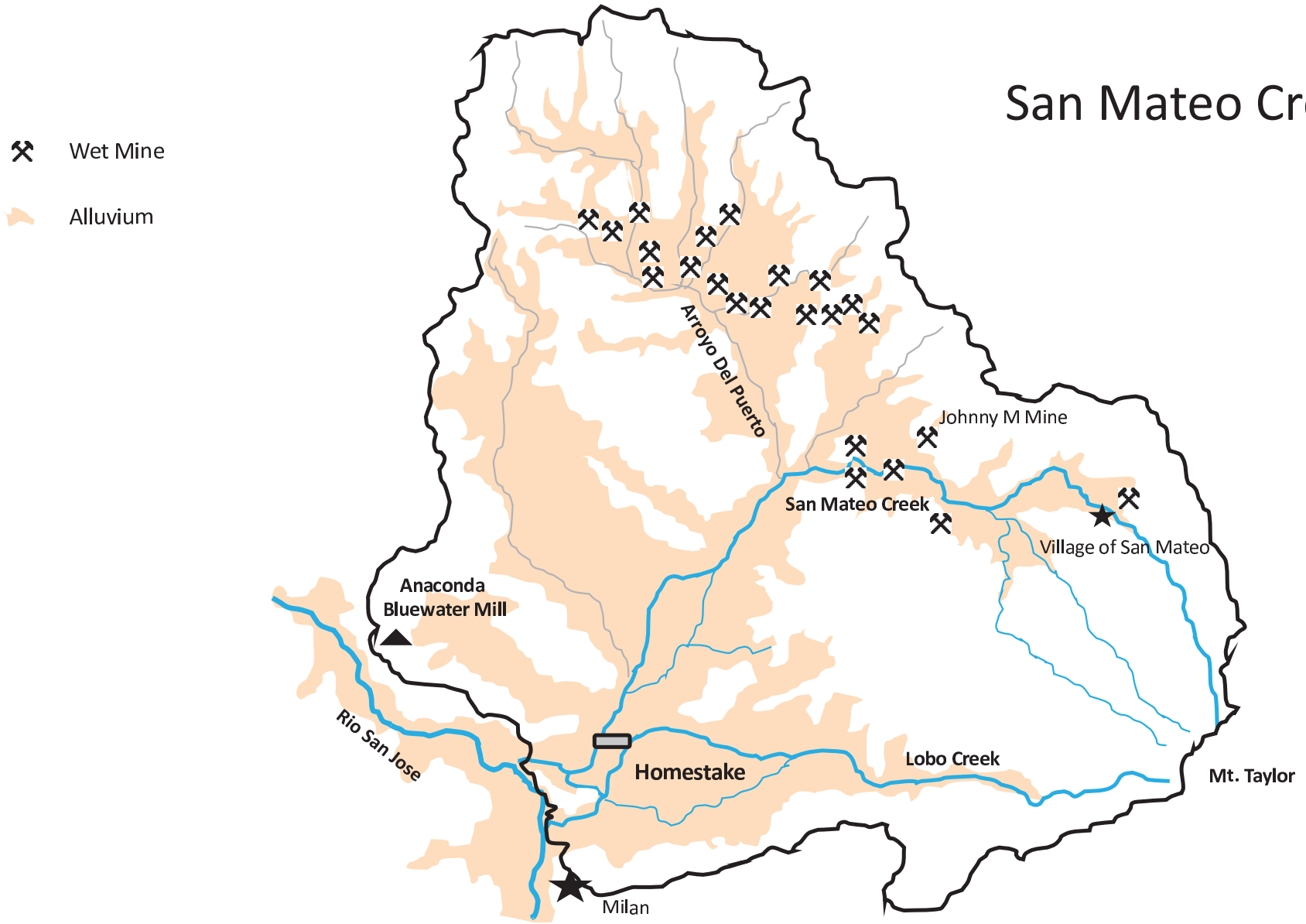
Site Cleanup Levels:

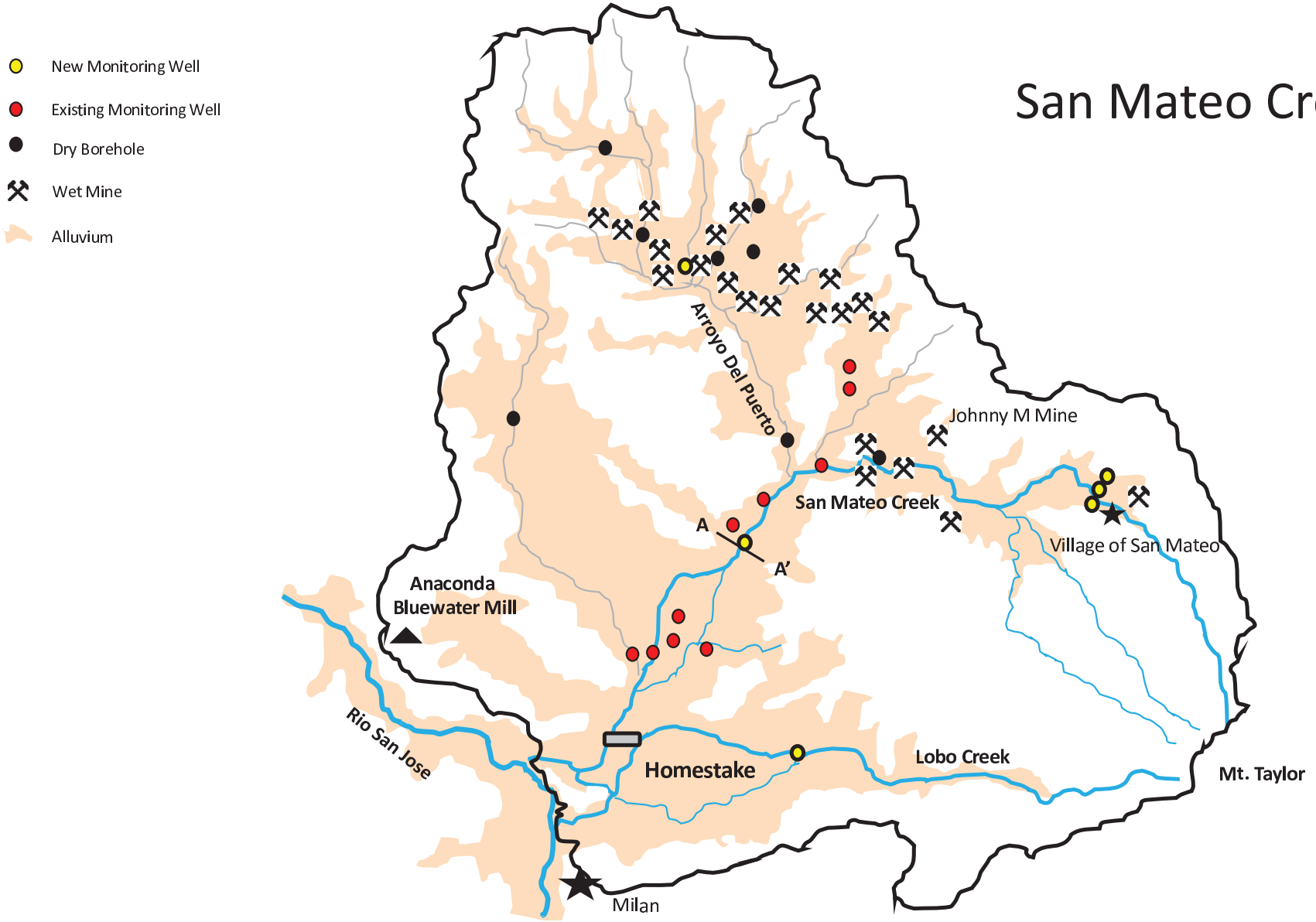
Established from background levels by NRC and NMED

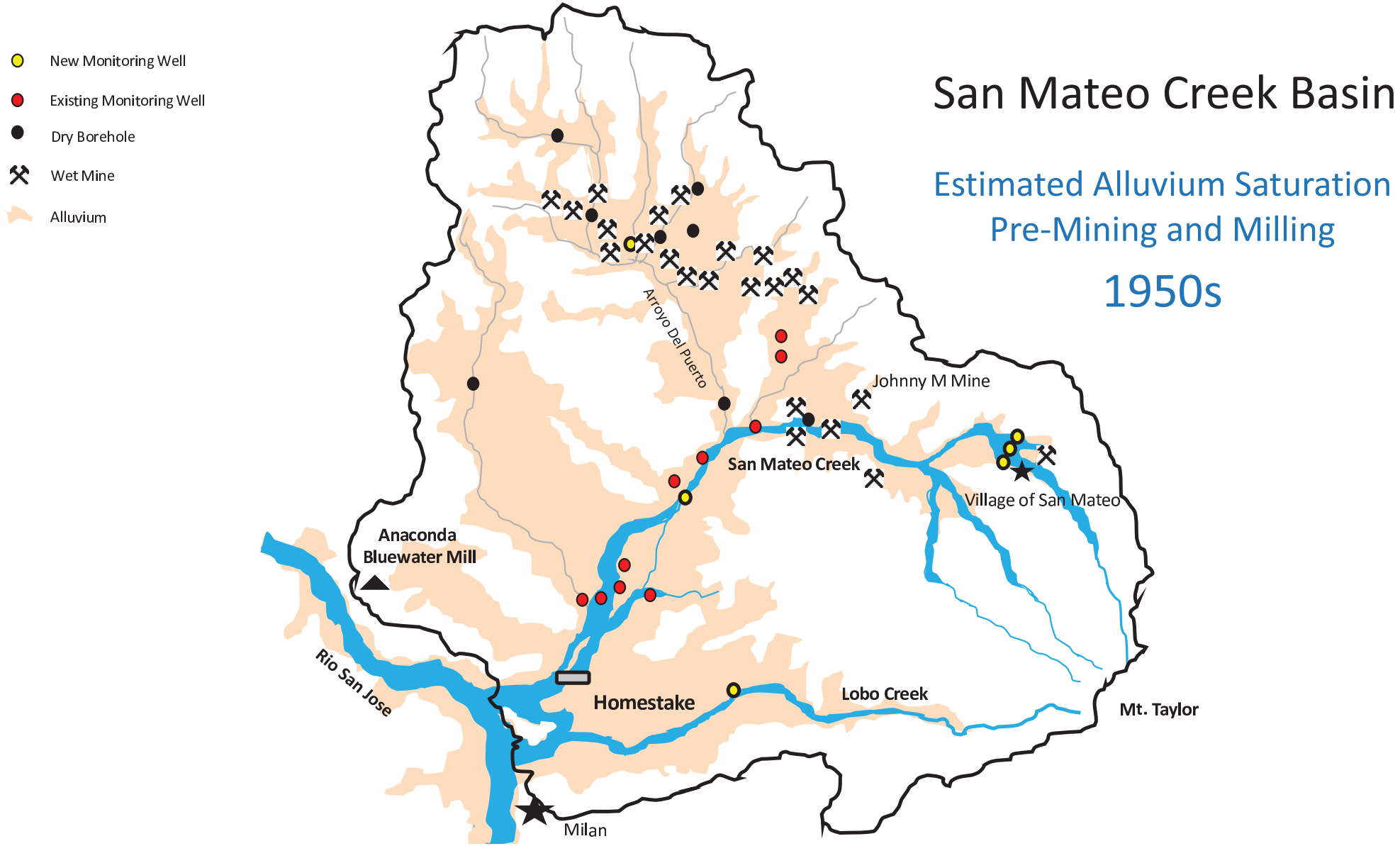
BVDA – Bluewater Valley Downstream Alliance

Ground Water Issues Extend Beyond Homestake – A Basin Wide Problem

- Ground Water Up-gradient of Homestake Impacted by Other Sources
  - Legacy Uranium Mines and Mills in San Mateo Creek Basin
- Impacted Up-gradient Water is Background Water at Homestake
  - Basis for Cleanup Levels

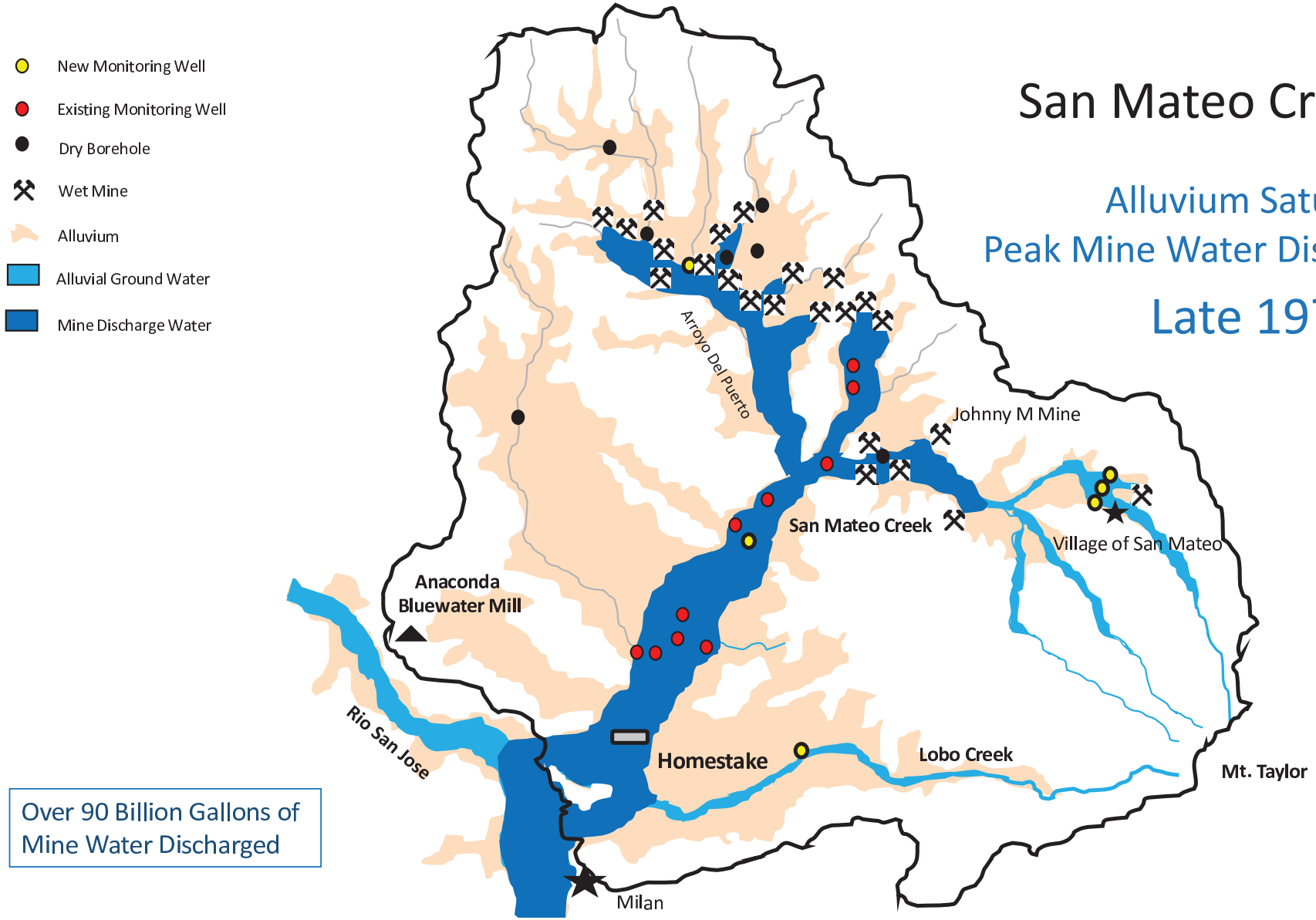

San Mateo Creek Basin
Wet Mine
Alluvium
Arroyo Del Puerto
Johnny M Mine
San Mateo Creek
Village of San Mateo
Anaconda
Bluewater Mill
Rio San Jose
Homestake
Lobo Creek
Mt. Taylor
Milan


New Monitoring Well
Existing Monitoring Well
Dry Borehole
Wet Mine
Alluvium
San Mateo Creek Basin
Arroyo Del Puerto
Johnny M Mine
San Mateo Creek
A
A'
Village of San Mateo
Anaconda
Bluewater Mill
Rio San Jose
Homestake
Lobo Creek
Mt. Taylor
Milan

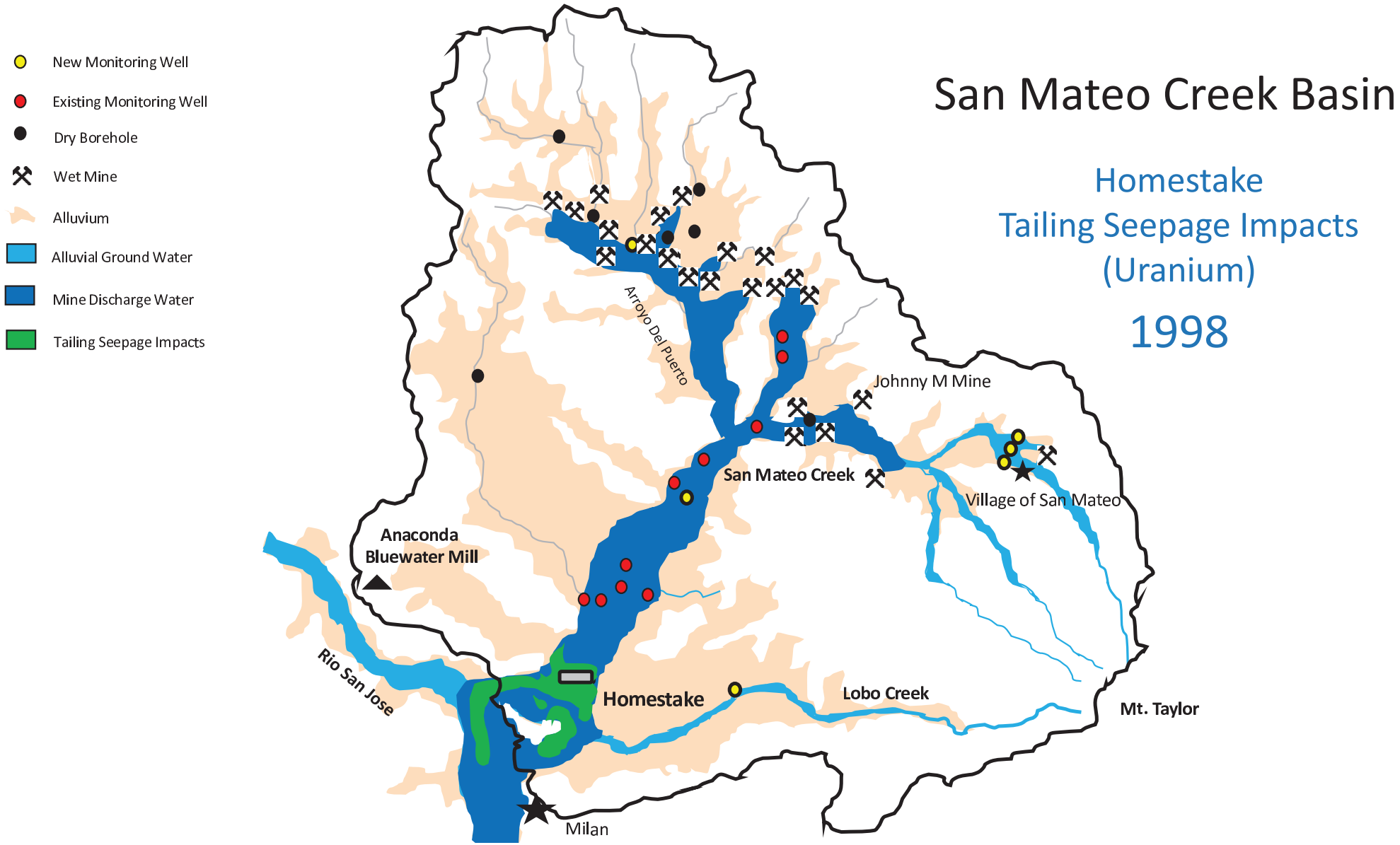

New Monitoring Well
Existing Monitoring Well
Dry Borehole
Wet Mine
Alluvium
San Mateo Creek Basin
Estimated Alluvium Saturation
Pre-Mining and Milling
1950s
Arroyo Del Puerto
Johnny M Mine
San Mateo Creek
Village of San Mateo
Anaconda
Bluewater Mill
Rio San Jose
Homestake
Lobo Creek
Mt. Taylor
Milan

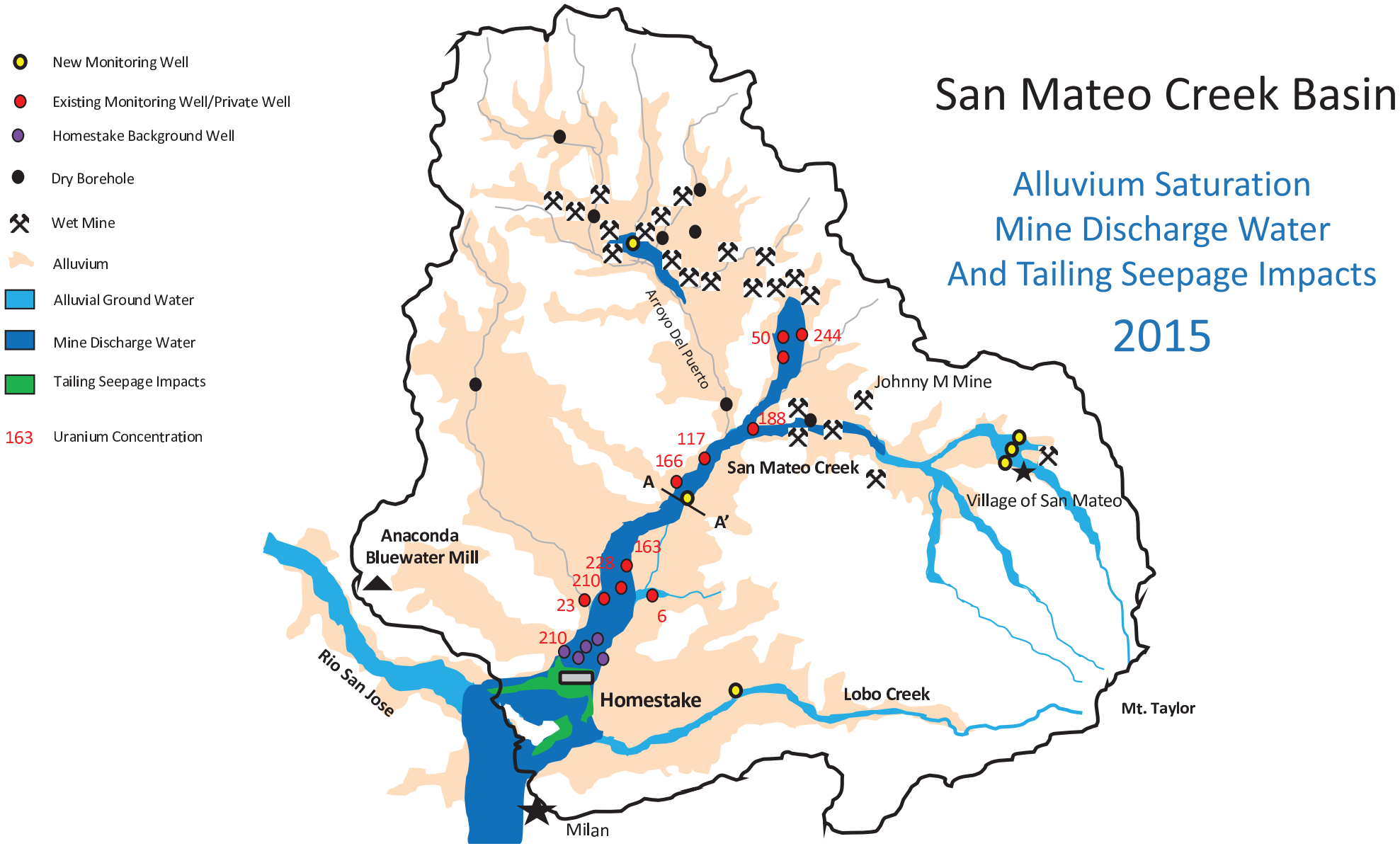
San Mateo Creek Basin

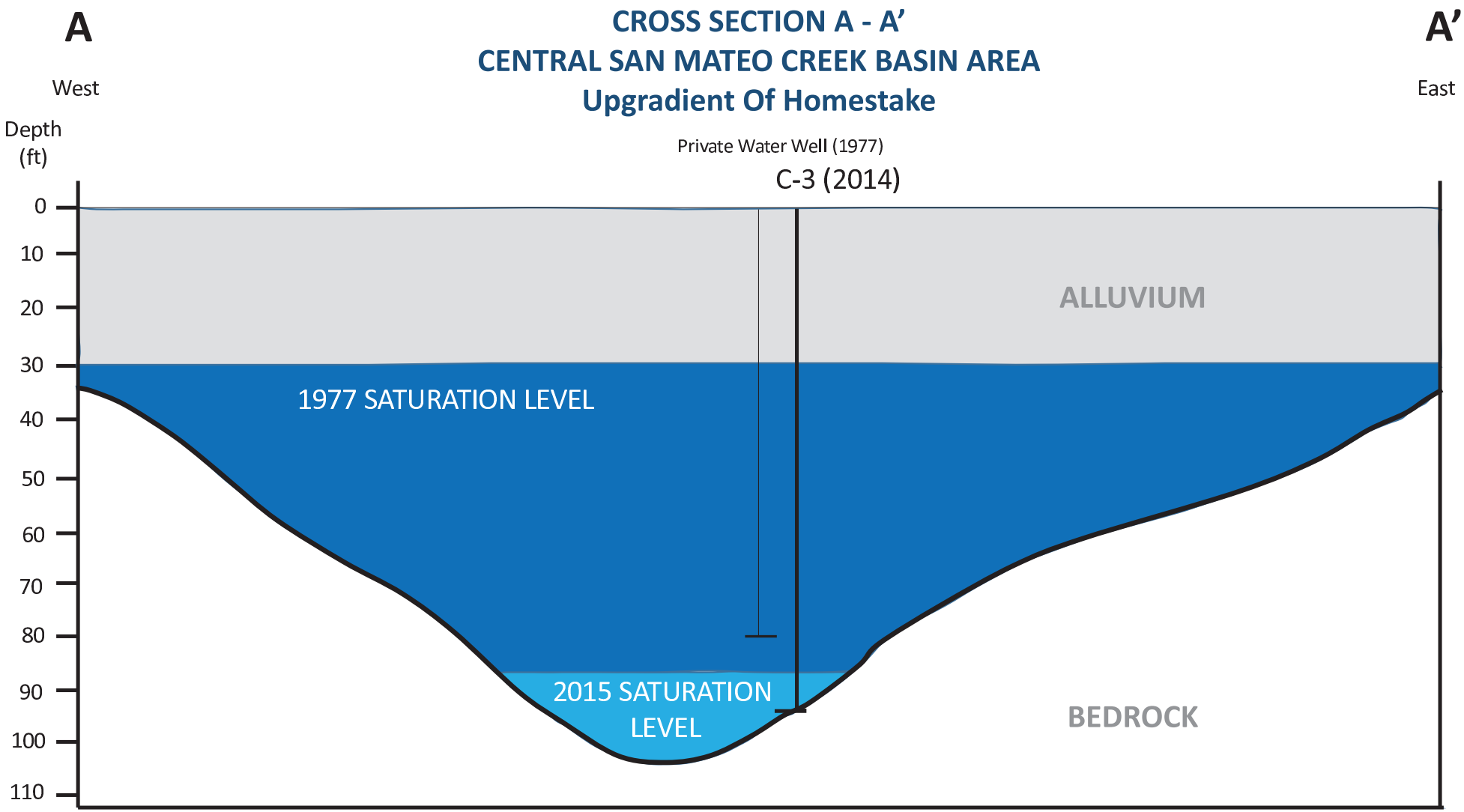
Alluvium Saturation
Peak Mine Water Discharge Period
Late 1970s



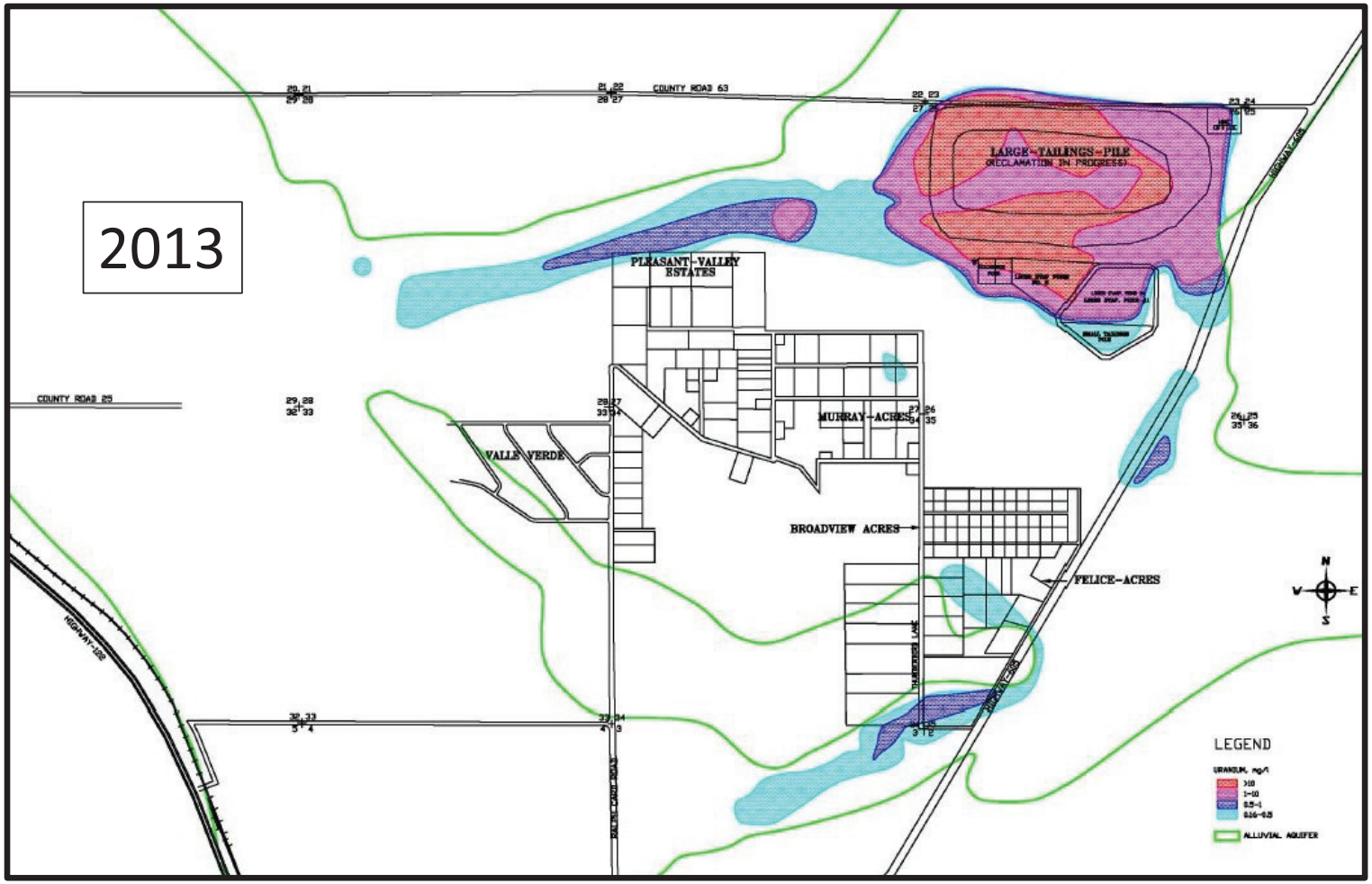
Over 90 Billion Gallons of Mine Water Discharged


New Monitoring Well
Existing Monitoring Well
Dry Borehole
Wet Mine
Alluvium
Alluvial Ground Water
Mine Discharge Water
Tailing Seepage Impacts
San Mateo Creek Basin
Homestake
Tailing Seepage Impacts
(Uranium)
1998
Arroyo Del Puerto
Johnny M Mine
San Mateo Creek
Village of San Mateo
Anaconda
Bluewater Mill
Rio San Jose
Homestake
Lobo Creek
Mt. Taylor
Milan

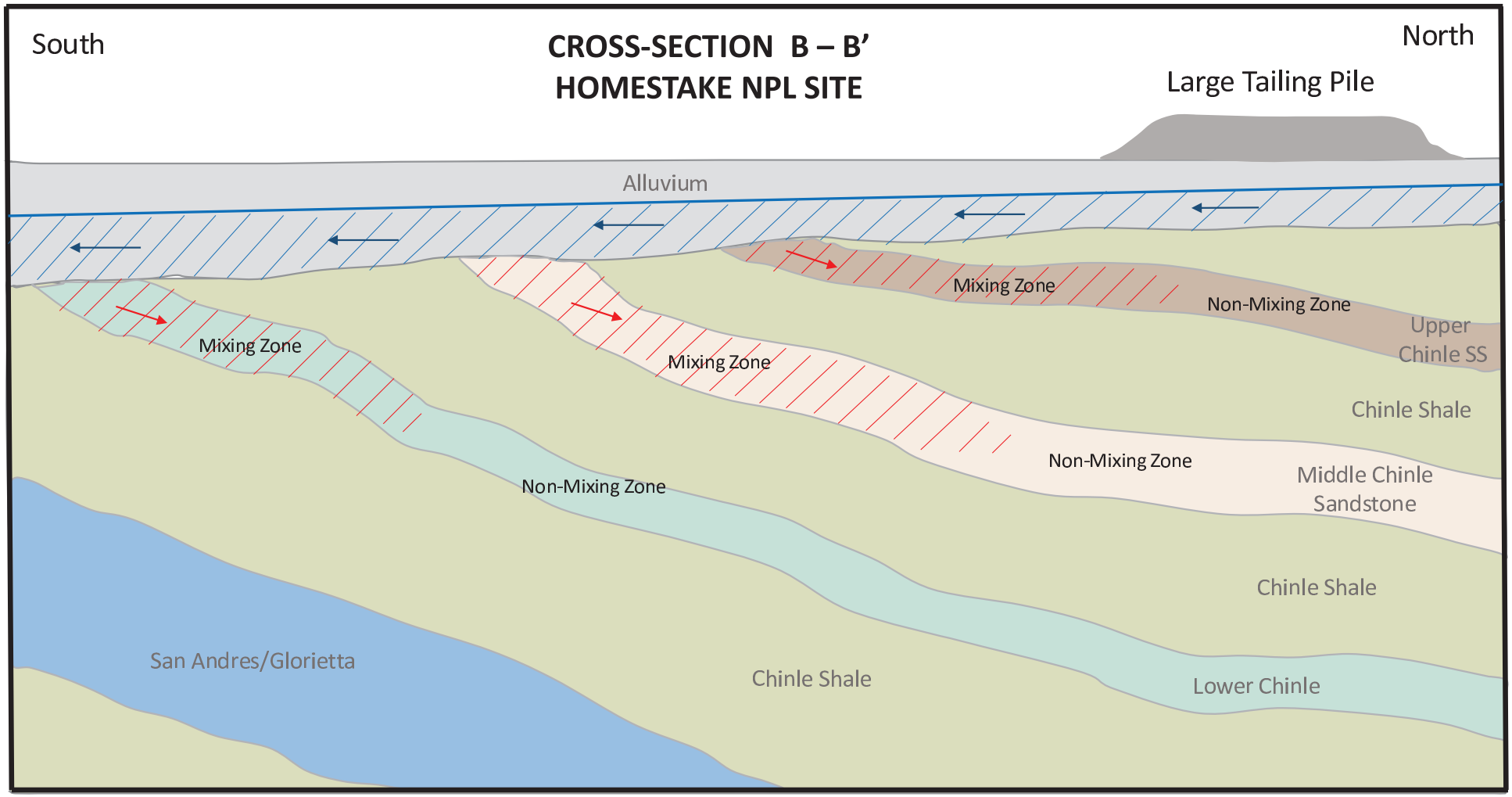

New Monitoring Well
Existing Monitoring Well/Private Well
Homestake Background Well
Dry Borehole
Wet Mine
Alluvium
Alluvial Ground Water
Mine Discharge Water
Tailing Seepage Impacts
163 Uranium Concentration
San Mateo Creek Basin
Alluvium Saturation
Mine Discharge Water
And Tailing Seepage Impacts
2015
Arroyo Del Puerto
50
244
Johnny M Mine
188
117
166
A
A'
San Mateo Creek
Village of San Mateo
Anaconda
Bluewater Mill
163
223
210
23
6
210
Rio San Jose
Homestake
Lobo Creek
Mt. Taylor
Milan


A
A'
CROSS SECTION A - A'
CENTRAL SAN MATEO CREEK BASIN AREA
Upgradient Of Homestake
West
East
Depth (ft)
Private Water Well (1977)
C-3 (2014)
0
10
20
30
40
50
60
70
80
90
100
110
ALLUVIUM
1977 SATURATION LEVEL
2015 SATURATION LEVEL
BEDROCK

TAILING SEEPAGE IMPACTS – ALLUVIAL AQUIFER
HOMESTAKE NPL SITE



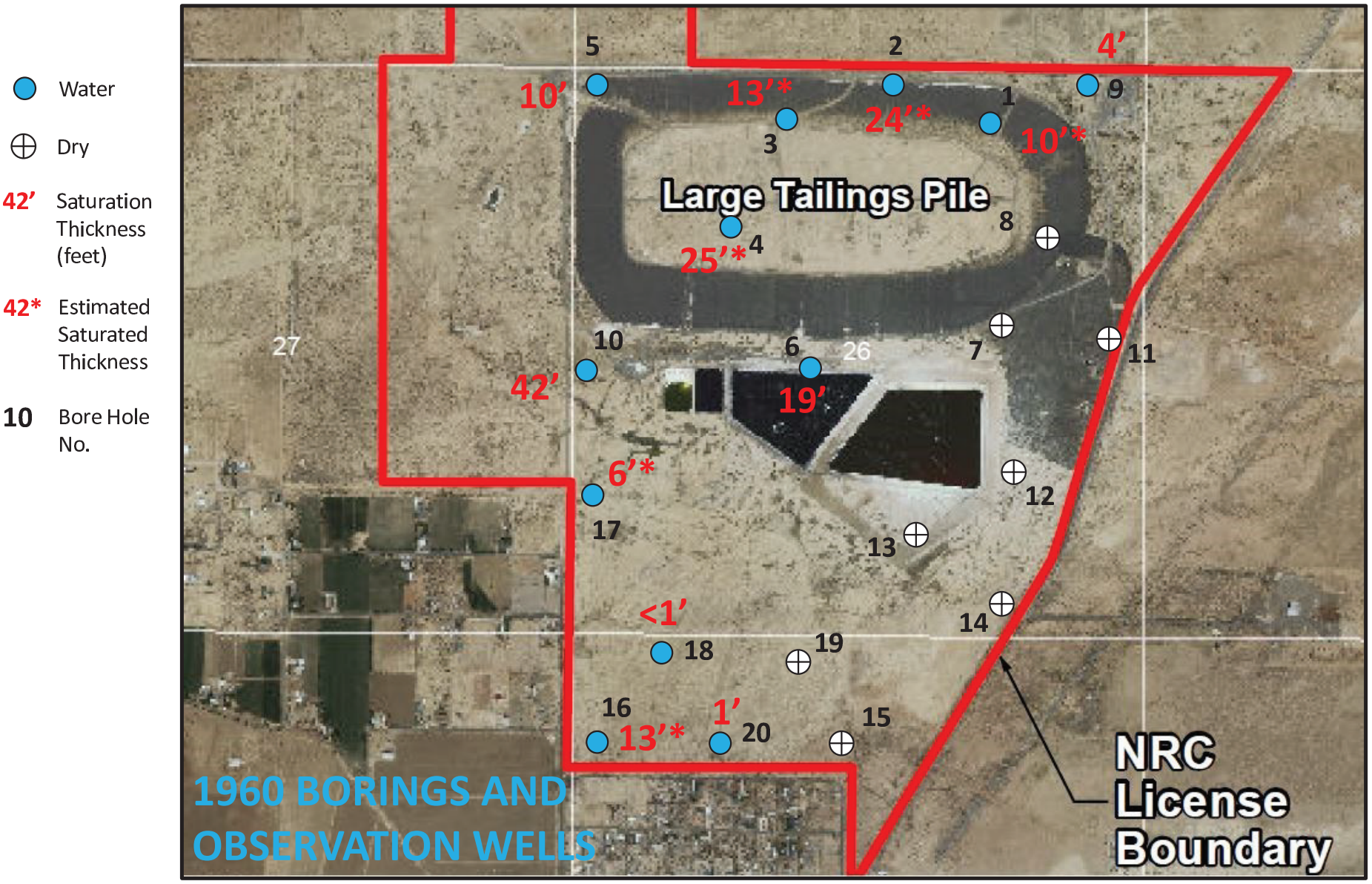
Area with >160 ppb Uranium - NRC Approved Background Concentration

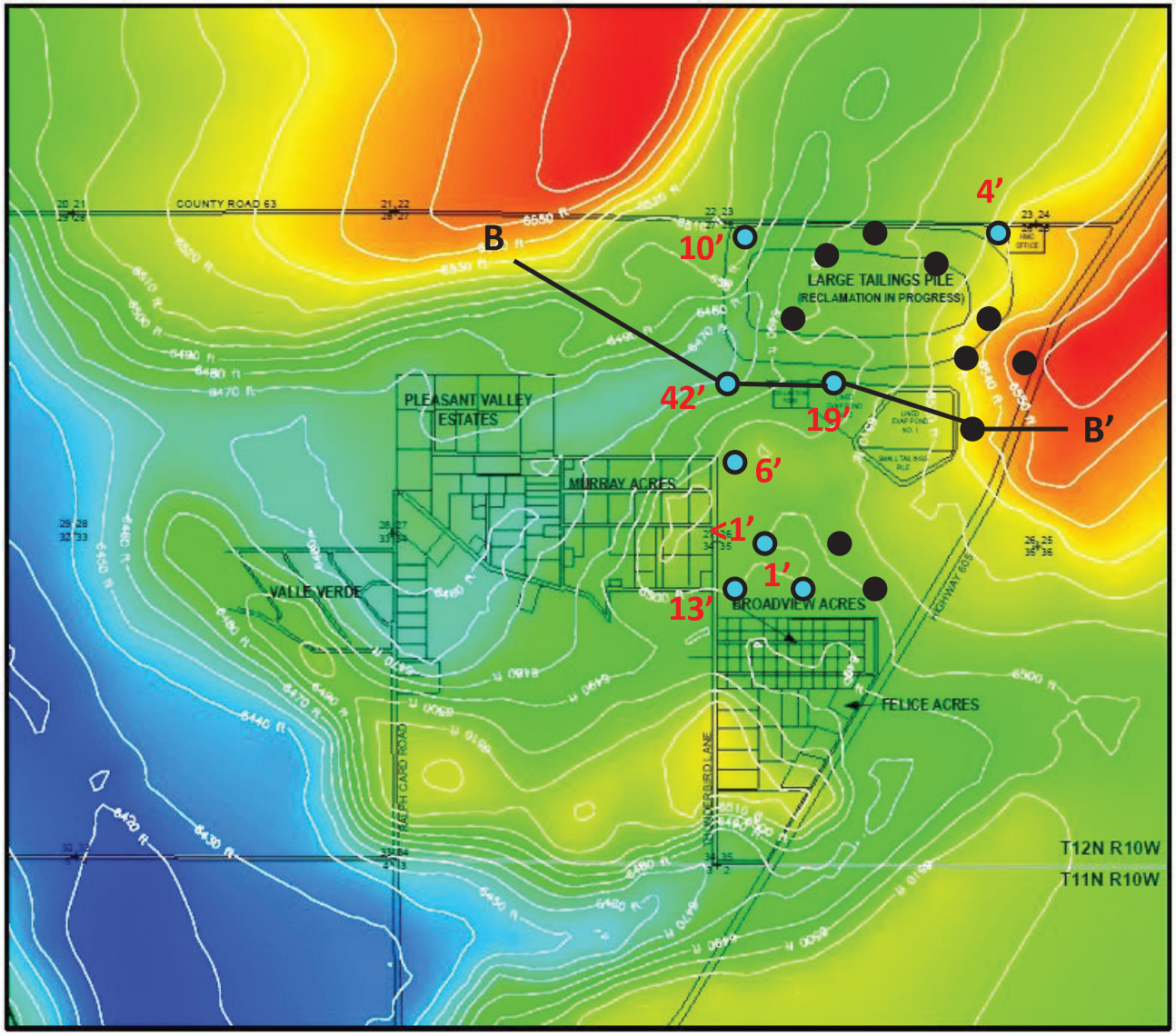

South
CROSS-SECTION B – B'
HOMESTAKE NPL SITE
North
Large Tailing Pile
Alluvium
Mixing Zone
Mixing Zone
Mixing Zone
Non-Mixing Zone
Upper
Chinle SS
Chinle Shale
Non-Mixing Zone
Middle Chinle
Sandstone
Non-Mixing Zone
Chinle Shale
San Andres/Glorietta
Chinle Shale
Lower Chinle

Alluvial Groundwater – BVDA Issues

BVDA Challenges EPA

- No alluvial ground water at site before milling!
  - Based on 1960 driller's logs
- Ground water is from Homestake!
- Why have cleanup numbers?

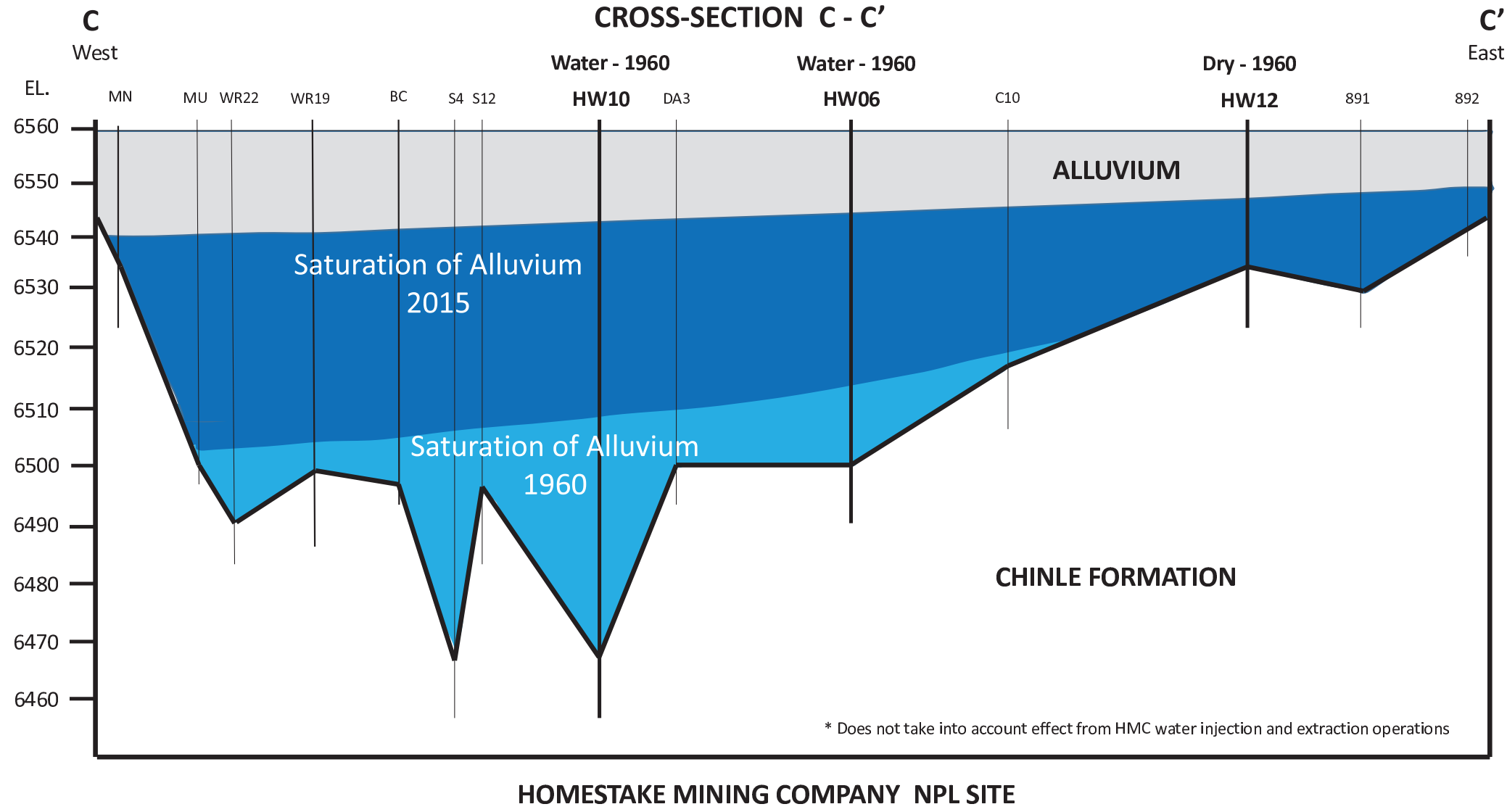

Water
Dry
42’ Saturation Thickness (feet)
42* Estimated Saturated Thickness
10 Bore Hole No.
5
10’
2
13’*
4’
9
1
24’*
3
10’*
Large Tailings Pile
8
25’*
4
27
10
6
26
7
11
42’
19’
6’*
12
17
13
<1’
14
18
19
16
1’
15
13’*
20
1960 BORINGS AND OBSERVATION WELLS
NRC License Boundary



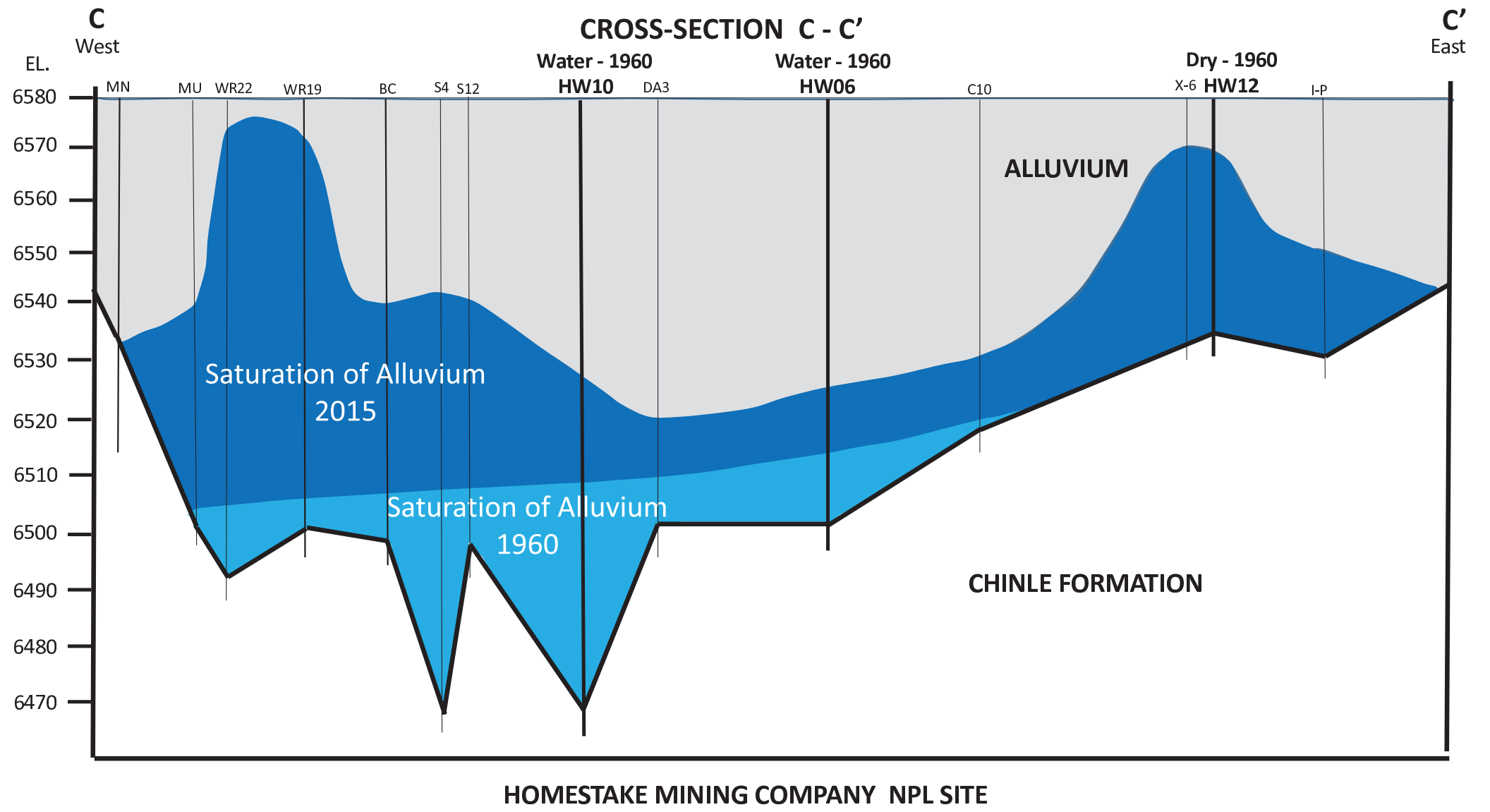
SATURATED ALLUVIUM 1960

- Water in Borehole
- Dry Borehole

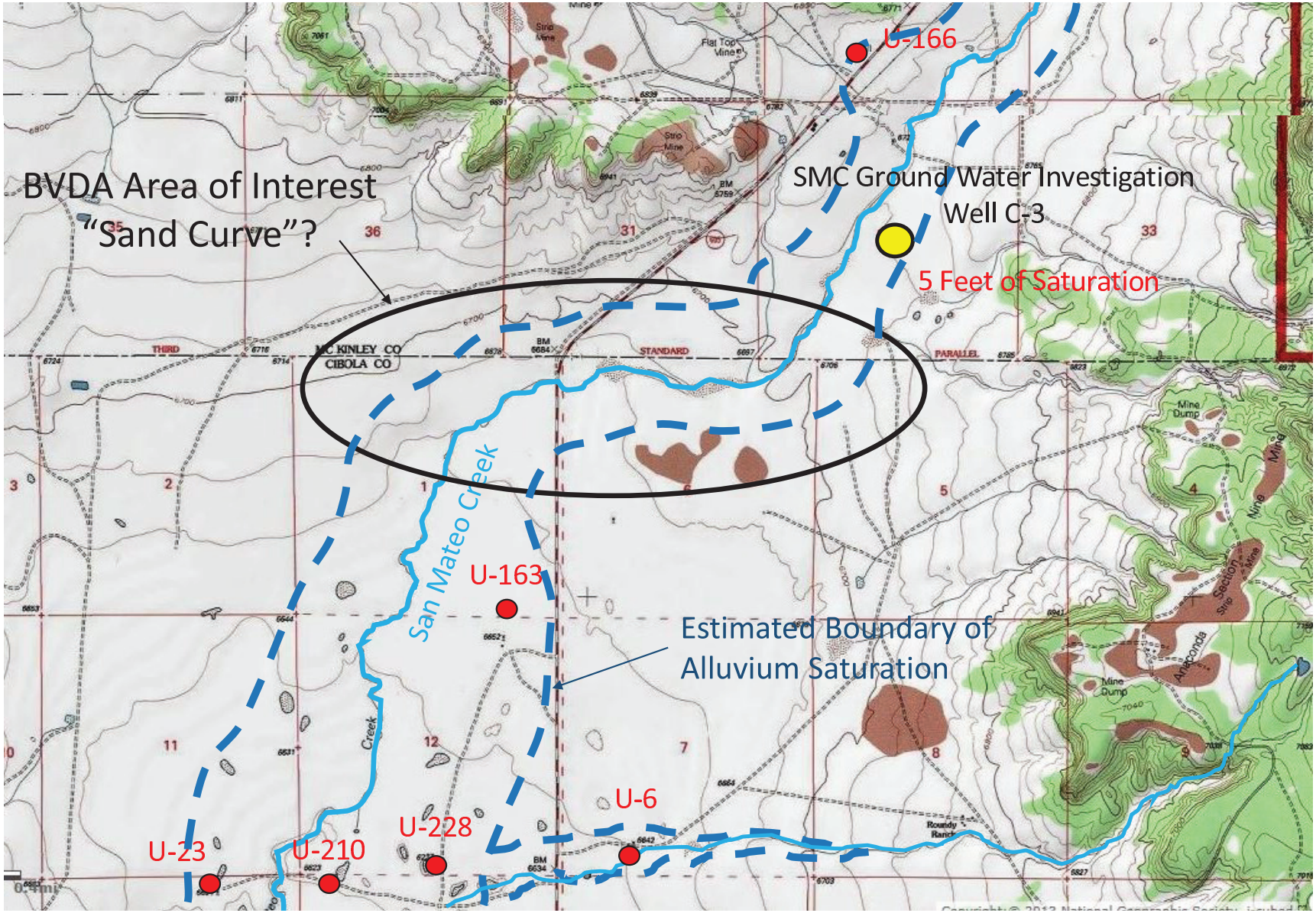
** Alluvial Ground Water Present in Area of Subdivisions In 1960*

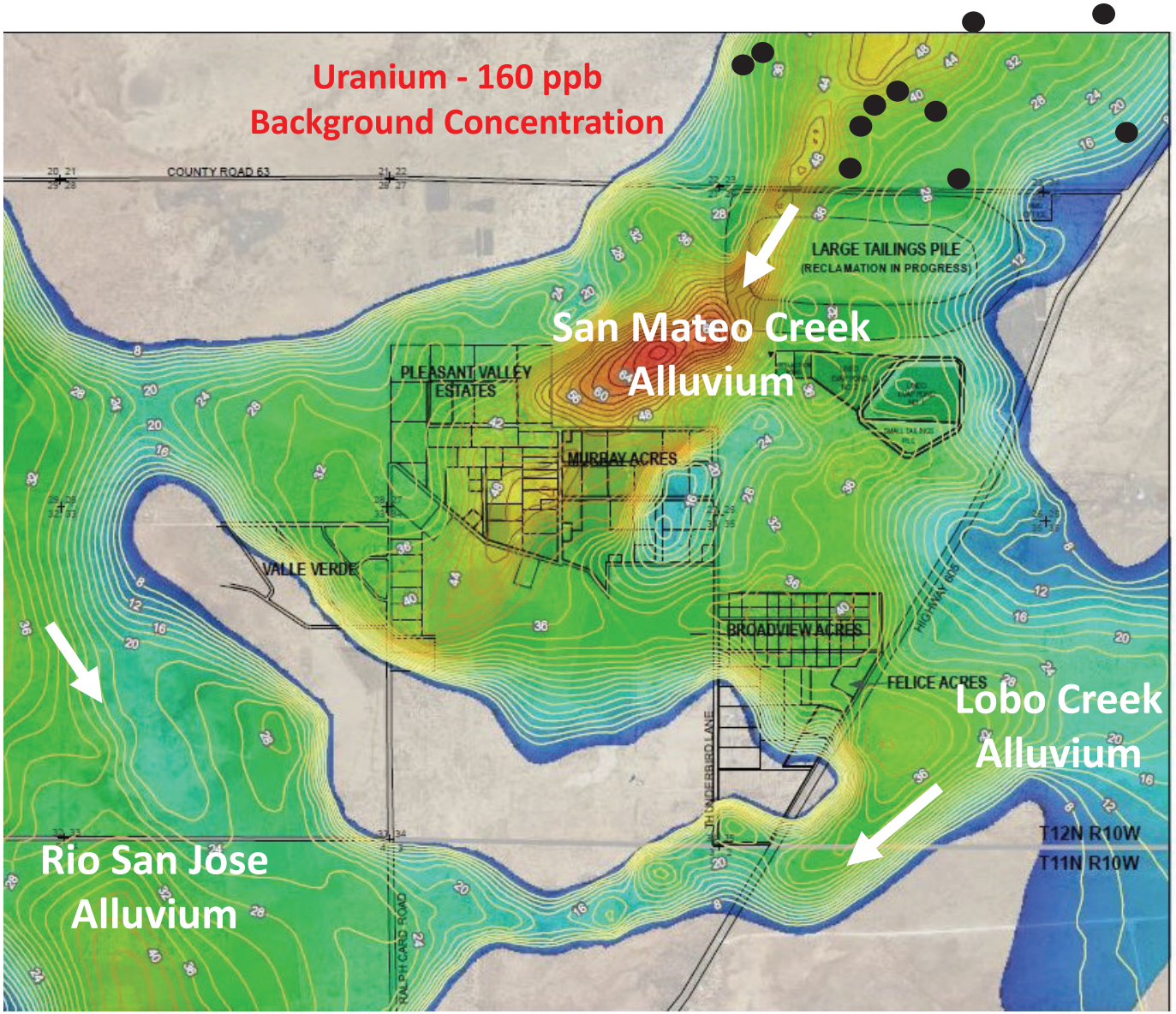


HOMESTAKE MINING COMPANY NPL SITE



HOMESTAKE MINING COMPANY NPL SITE

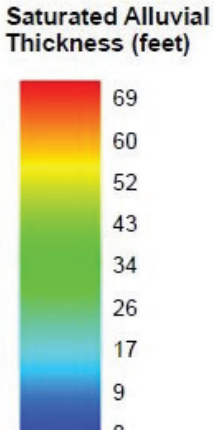

BVDA Area of Interest
"Sand Curve"?
SMC Ground Water Investigation
Well C-3
5 Feet of Saturation
U-166
U-163
U-6
U-228
U-210
U-23
San Mateo Creek
Estimated Boundary of
Alluvium Saturation
MC KINLEY CO
CIBOLA CO
THIRD
STANDARD
PARALLEL
Flat Top Mine
Strip Mine
Mine Dump
Anaconda
Roundy Ranch
BM 6684
BM 6759
BM 6634
0 1 mi



EPA ISSUES WITH ALLUVIAL BACKGROUND VALUES

THREE ALLUVIAL WATER SYSTEMS

Site Alluvium Background Concentrations Based Only on San Mateo Creek Alluvial Water Quality

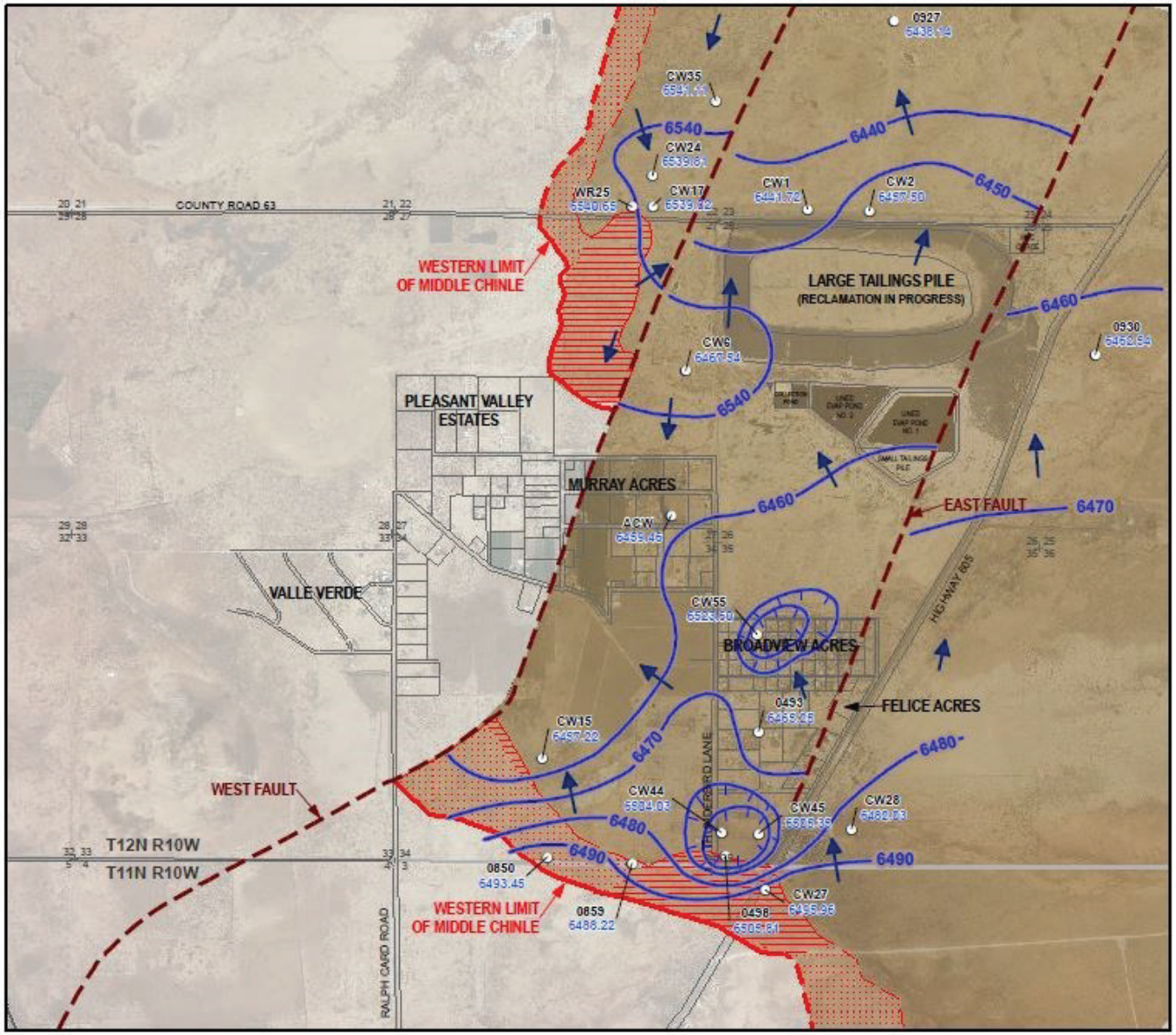


- Homestake Background Well

Chinle Groundwater – BVDA Issues

BVDA Challenges EPA

- Why are cleanup standards for Chinle aquifers so high?
  - Higher than water quality in private wells?
- By accepting "Mixing Zone" agencies allow Homestake to contaminate Chinle aquifers
  - Allows cleanup to poorer water quality!



EPA ISSUES WITH CHINLE BACKGROUND VALUES

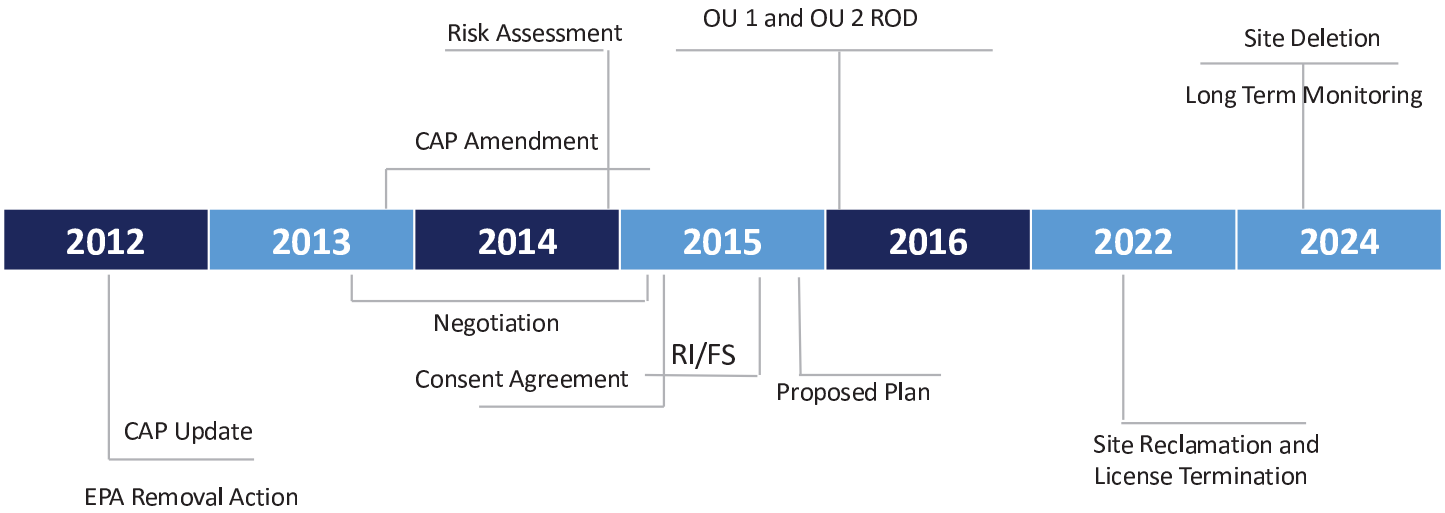
SEPARATE FAULT BLOCKS AND AQUIFERS OF MIDDLE CHINLE MAY REQUIRE DIFFERENT CLEANUP VALUES

Mixing Zone
- Uranium – 0.180 ppm
- TDS – 3140 ppm

Non-Mixing Zone
- Uranium – 0.070 ppm
- TDS – 1560 ppm

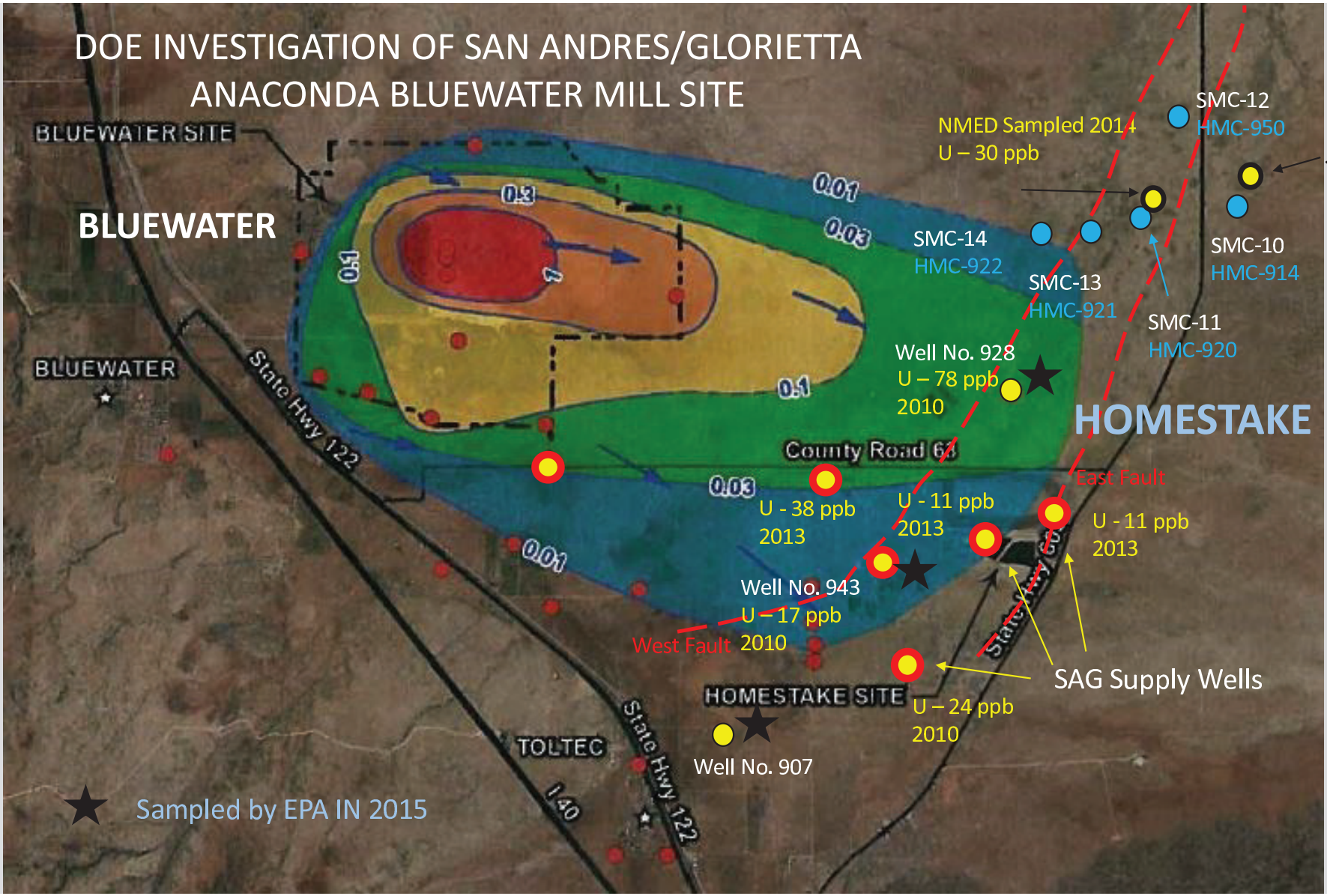
Current Schedule for Site

(EPA completes ROD in parallel with NRC license termination)



Planned Community Meetings
BVDA Meeting – March 2015
Summer 2015 – Proposed Plan Meeting

EXTRA SLIDES

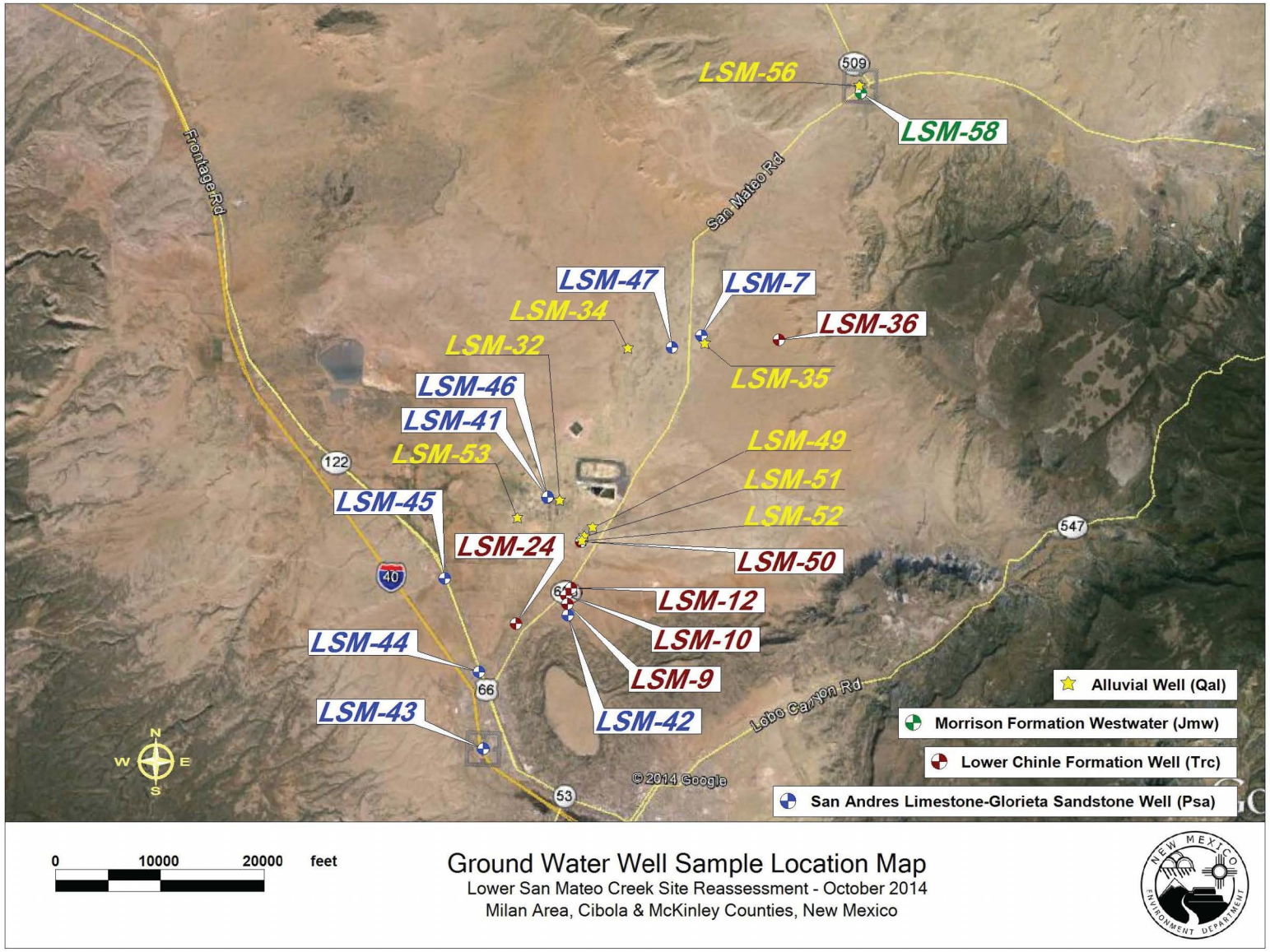

DOE INVESTIGATION OF SAN ANDRES/GLORIETTA
ANACONDA BLUEWATER MILL SITE
BLUEWATER SITE
BLUEWATER
BLUEWATER
State Hwy 122
0.2
0.1
0.01
0.03
0.1
0.03
0.01
NMED Sampled 2014
U – 30 ppb
SMC-12
HMC-950
NMED Sampled 2014
<1.0 ppm
SMC-14
HMC-922
SMC-13
HMC-921
SMC-10
HMC-914
SMC-11
HMC-920
Well No. 928
U – 78 ppb
2010
HOMESTAKE
County Road 63
East Fault
U - 38 ppb
2013
U - 11 ppb
2013
U - 11 ppb
2013
Well No. 943
U – 17 ppb
2010
West Fault
State Hwy 122
SAG Supply Wells
HOMESTAKE SITE
U – 24 ppb
2010
Well No. 907
TOLTEC
I-40
State Hwy 122
Sampled by EPA IN 2015

EPA Review of Draft RI Report

- Review Nearly Complete
- Overall Quality of Draft Report Good
- Additional Investigatory Work May be Needed
  - Ground water Impacts not fully delineated in Middle Chinle
  - Water Quality of Rio San Jose and Lobo Creek Alluvial Systems
  - Could impact schedule for completing RI/FS

Next Steps

- Send EPA comments and set up meeting to discuss background issues
- Meet with BVDA on March 5, 2015
  - Exploring video conference
  - Present preliminary EPA analysis of background
  - Present status update on San Mateo Creek Basin groundwater study
    - Data from Private Well Sampling will not be summarized and reported until Spring 2015



Ground Water Well Sample Location Map

Lower San Mateo Creek Site Reassessment - October 2014

Milan Area, Cibola & McKinley Counties, New Mexico

NMED PRIVATE WELL SAMPLING FALL - 2014

PERFORMED AT THE REQUEST OF BVDA